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Bruhat Bengaluru Mahanagara Palike

CONSULTANCY SERVICES FOR THE PREPARATION OF

DETAILED PROJECT REPORT

Name of Work: Restoration and Improvements of Channamma and Narayanappa layout, Narayanagowda layout, Basavalingappa layout and surrounding areas in ward no -03 of Yelahanka New town Sub division.

(PACKAGE NO-11)

AARTN ASSOCIATES
The Modern Construction Solution

#1059, MIG-A Sector, Opp Railwheel Factory
Yelahanka New Town, Bangalore-560064
CELL: 8048505503

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GO.Sl. No	Name of work	Estimate cost, Rs in Lakhs
01.	Restoration and Improvements of Channamma and Narayanappa layout, and surrounding areas in ward no-03 of Yelahanka Satellite town sub division.	300.00
02.	Restoration and Improvements of Narayanagowda layout,,and surrounding areas in ward no-03 of Yelahanka Satellite town sub division.	300.00
03.	Restoration and Improvements of Basavalingappa layout and surrounding areas in ward no-03 of Yelahanka Satellite town sub division.	400.00
	Total cost of the project in Lakhs Rs.	1000.00

Estimated cost in Rs.1000.00

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CHAPTER-1 INRODUCTION

1.1 Project Background

The well-connected road network helps to boost the economy and prosperity of the area. The good roads provide benefit to road users. Bengaluru is the third largest populated city in India with a total population of 12.50 million. It is also called as garden city. There are many gardens and parks. The ancient Bangalore was found in sixteenth century and served as centre of administration for many rulers. The city has then witnessed steep growth in population because of the many industries in the field of Information Technology, Power, Construction, Real Estate,Health, Machineries and Auto-mobiles, Textile, Iron and Steel and Defence etc. Bengaluru is the capital of Karnataka state which has under gone revolutionary changes in various fields and witnessed steep growth in Auto-mobile Industry. It is a growing metropolitan city faces many challenges especially in pollution and logistical areas. The city is situated at an altitude of 900mts with co-ordinates of 12o 58' N (Latitude) and 77o 34' E (Longitude). The temperature varies from 23oC and 36oC. The average Rainfall of the area is about 850mm per year. The city is well connected with remaining part of the country through Road, Rail network and Air.

Bengaluru Rural District is one of the 30 districts in Karnataka, India. It was formed in 1986, when Bengaluru was divided into Bengaluru (Rural) and Bengaluru (Urban). Presently in Bengaluru Rural district, there are 2 divisions, 4 Talukas, 35 Hubli's (cluster of villages), 1,713 inhabited and 177 uninhabited villages, 9 towns, and 229 Gram Panchayats. Proximity to the city of Bengaluru has its own impact on the district, with a considerable daily commuting population. The rural people are mostly agriculturists, although with the advent of SEZs in the area, service and IT industries are booming. Devanahalli is set to be the site of a 95 billion Devanahalli Business Park, near the Bengaluru International Airport.

According to the 2001 census, the total population of the district was, 1,881,514 of which 21.65% were urban with a population density of 309 persons per km2. The Bengaluru Rural district is essentially an agriculture district but it has sufficient scope for Industrialization, Dairy development and Sericulture.

The district is endowed with agricultural and horticultural crops such as ragi, rice, groundnut, sugarcane, castor, grapes, mulberry, etc. There are adequate infrastructural facilities such as transport and communications, banking, credit, and marketing. Though the region is not rich in mineral resources, its non-metallic mineral resources are utilized for bricks, tiles, and stoneware manufacture. For many years, weaving has also been a major occupation for a large section of the population. The soil and such climatic conditions are congenial for the cultivation of mulberry, rearing of silkworms, and production of silk, besides other agro-based industries. There are a number of wineries and quantity of

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production of wine has been increasing. There is a proposal by the Government of Karnataka to rename Bengaluru Rural district to Kempe Gowda.

Bruhat Bangalore MahanagaraPalike has decided to improve the existing road network system, drains and footpath facilities for pedestrians in order to cope up with the growing demand of two wheelers, light commercial and heavy vehicles.

AARTN ASSOCIATES has been appointed as a consultant to perform the services. Report deals with the approach, methodology, investigation details of project roads and the role of Consultants.

OBJECTIVE

The objective of the present task is to prepare a detailed project report covering various studies viz., Topography survey, Subsoil investigations, Traffic surveys, Hydraulics and Total station surveys. The proposed improvements consist Design of Geometrics, side drains, Junctions, Culverts, Widening/Strengthening/Reconstruction of carriageway along with Footpath and road safety measures. The scope of work also includes the quantifying of various items of works and cost estimates for the Package -08.

Proposed Roads as:

"Consultancy Service for Detailed Project Report, Field Survey, General Report, Basic Drawing, Technical Report, Detailed Drawing, Detailed Cost Estimate for Restoration and Improvements of Channamma and Narayanappa layout, Narayanagowda layout, Basavalingappa layout and surrounding areas in ward no -03 of Yelahanka New town Sub division (PACKAGE NO-11)

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4.6 Design Standards Related to Road Furniture and Appurtenances

Utility and importance of the road are greatly enhanced by initialling road furniture and appurtenances at appropriate locations along the project road, which ensure improved road safely. Planning and design of road furniture and appurtenances are a per the guidelines stipulated in IRC. Detailing of each of these components has been done so as to integrate the same with the road improvement scheme. The suggested design values/standards are detailed in Table4.6

Table 4.6 Design Standards Related to Road Furniture and Appurtenances

Sl. No	Design Parameters	Reference Code/Design Values
1	Road Markings	IRC:35-1997 "Code of Practice for Road Markings"
2	Road Signs	IRC:67-2001 "Code of Practice for Road Signs"
3	Road Delineators	IRC:79-1981 "Recommended Practice for Road Delineators"
4	Pedestrian Facilitates	IRC:103-1988 "Guidelines for Pedestrian Facilities"

In addition to the above measures various other integral road components have been planned so as to achieve the maximum and optional use of the carriageway with no/ least interference to traffic flow at the same time ensuring adequate facilities to other road users especially pedestrians. All the encroachments, if any shall be cleared within the ROW.

4.7 Design Standards Related to Bridges and CD Structures

The design standards and loading considered for culverts and bridges are as stipulated in latest IRC codes/ Special publications supplemented by appropriate MOST circulars and/or IS codes. The unsafe and/or deficient bridge and culvert structures (existing) will be rehabilitated or replaced by sound structures.

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TABLE 5.1 CBR RESULTS

The necessary tests for representative sub-grade soil samples collected from site have been conducted and finally the CBR values are tabulated as follows:

Sl No	Name of Road	Avg CBR Values in%
a	Restoration and Improvements of Channamma and Narayanappa layout and surrounding areas in ward no-03 of Yelahanaka Satellite town sub division	3.00
b	Restoration and Improvements of Narayanagowda layout and surrounding areas in ward no-03 of Yelahanaka Satellite town sub division	3.00
c	Restoration and Improvements of Basavalingappa layout and surrounding areas in ward no -03 of Yelahanaka Satellite town sub division	4.00

TESTING OF SOIL SAMPLES

Sub: Testing of soil samples.

{Name of Work * **Comprehensive Development of Roads and Drains in – (Package No-11)}**

Identification*: IS:2720 & MORTH Specifications, V- Revision-2013

Table No-5.2: Soil Test Results

Sample	Gravel	Sand	Silt and Clay	Maximum Dry Density, gm/cc	Optimum moisture content (OMC), %	Avg.Soaked CBR Value. %
a	10.40	46.10	43.50	1.62	12.70	8.4
b	14.90	51.60	37.50	1.69	10.30	8.2
c	13.50	39.20	37.30	1.64	10.95	8.6
d	12.40	44.90	36.70	1.57	14.15	8.5
e	11.60	51.20	47.20	1.59	12.20	8.1
f	15.80	42.20	39.30	1.68	10.95	8.8
g	14.60	37.20	34.20	1.63	12.20	8.9
h	14.90	51.60	33.50	1.69	10.30	9.1

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"Consultancy Service for Detailed Project Report, Field Survey, General Report, Basic Drawing, Technical Report, Detailed Drawing, Detailed Cost Estimate for Restoration and Improvements of Channamma and Narayanappa layout, Narayanagowda layout, Basavalingappa layout and surrounding areas in ward no -03 of Yelahanka New town Sub division (PACKAGE NO-11)"

The various Codes and IRC, BS, AASHTO Adopted for Design as standards along with MORTH Vth Revision are as follows:-

Field Dry Density (FDD) using Sand Replacement Method	IS: 2720 (Part 28)
Field Dry Density (FDD) using Core Cutter Method	IS: 2720 (Part 29)
Moisture Content Determination	IS: 2720 (Part 2) (Section I)
Atterberg Limits	IS: 2720 (Part 5)
Sieve Analysis - Natural soils - Rock aggregate	 IS: 2720 (Part 4) IS: 2386 (Part 1)
Compaction Test (Heavy Compaction)	IS: 2720 (Part 8)
CBR (Soaked and unsoaked at three energy levels for sub-grade)	IS: 2720 (Part 16)
Free Swell Index	IS: 2720 (Part 40)
Aggregate Impact Value (AIV)	IS: 2386 (Part 4)
Coating and Stripping of Bitumen Aggregate Mixes	IS: 6241
Soundness of Aggregates	IS: 2386 (Part 5)
Flakiness and Elongation Indices	IS: 2386 (Part 1)
Water Absorption and Specific Gravity of Aggregates	IS: 2386 (Part 3)
10 % Fines Value for Aggregates	BS: 812 (Part 111)

Soil classification has been done according to the Indian Soil Classification (ISC) System, as detailed in IS: 1498.

SL NO.	Design Parameters	Reference Code
1	Geometric Design Standards • Carriageway width • Shoulder • Footpath • Median • Camber • Super Elevation • Horizontal Alignment • Vertical Alignment	As per IRC:38-1988 IRC:86-1983 & IRC: SP:38-1993
2	Road Furniture • Road Delineators • Road Markings • Road Signs	As per IRC:79-1981 As per IRC:35-1997 As per IRC:67-2001
3	Road Capacity	As per IRC:106-1990
4	Pavement Design	As per IRC:37-2012& IRC: SP:62-2014 , IRC 58-2015
5	Overlay Design	As per IRC:81-1997
6	Road Drainage	As per IRC: SP:42-1994& As per IRC: SP:50-1999
7	Culverts	As per relevant IRC codes and MORT&H

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8	Road Markings	IRC:35-1997 "Code of Practice for Road Markings"
9	Road Signs	IRC:67-2001 "Code of Practice for Road Signs"
10	Road Delineators	IRC:79-1981 "Recommended Practice for Road Delineators"
11	Pedestrian Facilitates	IRC:103-1988 "Guidelines for Pedestrain Facilities"
12	Standard Specifications and Code of Practice for Prime and Tack Coat	IRC:16-2008
`13	Code of Practice for Road Markings (Second Revision	IRC:35-2015
14	Recommended Practice for Construction of Earth Embankments and Sub-Grade for Road Works	IRC:36-2010
15	Guidelines for Cement Concrete Mix Design for Pavements	IRC:44-2017
16	Guidelines for the Design of Plain Jointed Rigid Pavements	IRC:58-2015
17	Standard Specifications and Code of Practice for Road Bridges, Section VII- Foundations and Substructures	IRC:78-2014
18	Recommended Practice for Road Delineators	IRC:79-1981
19	Guidelines for Strengthening of Flexible Road Pavements Using Benkelman Beam Deflection Technique	IRC:81-1997
20	Code of Practice for Curing of Cement Concrete Pavements	IRC:84-1983
21	Recommended Practice for Accelerated Strength Testing & Evaluation of Concrete	IRC:85-2015
22	Guidelines for Capacity of Urban Roads in Plain Areas	IRC:106-1990
23	Guidelines for Wet Mix Macadam	IRC:109-2015
24	Specifications for Dense Graded Bituminous Mixes	IRC:111-2009
25	Guidelines for the use of Waste Plastic in Hot Bituminous Mixes (Dry Process) in Wearing Courses	IRC:SP-98-2013
26	Road Drainage	IRC :SP-50-1999
27	Overlay Design	IRC: 81-1997

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"Consultancy Service for Detailed Project Report, Field Survey, General Report, Basic Drawing, Technical Report, Detailed Drawing, Detailed Cost Estimate for Restoration and Improvements of Channamma and Narayanappa layout, Narayanagowda layout, Basavalingappa layout and surrounding areas in ward no -03 of Yelahanka New town Sub division (PACKAGE NO-11)"

IS Standards		
1	Aggregate impact	IS:2386 (part-4) or IS:5640
2	value	IS:2720 (Part-5)
3	Liquid limit	IS:2720 (Part-5)
4	Plasticity index	IS:2720 (Part-5)
5	CBR @ 98% density	IS : 2386 (Part-4)
6	Los Angeles abrasion value Or Aggregate	IS : 2386 (Part-4)
7	Impact value	IS : 2386 (Part-4) or IS:5640
8	Combined Flakiness and Elongation(Total)	IS : 2386 (Part-1)
9	Los Angles Abrasion	IS:2386(Part-4)
10	Aggregate Impact value	IS:2386(Part-4)
11	Flakiness and ElongationIndices (Total)	IS:2386(Part-1)
12	(i) Loss with Sodium Sulphate-5cycles	IS:2386(Part-5)
13	(ii) Loss of Magnesium Sulphate-5 cycles	
14	Water absorption	IS:2386(Part-3)
15	Compaction of GSB/WMM layer	IS:2720(Part-08)
	AASHTO	
1	Coating and Stripping of Bitumen aggregate MixturesSoundness	AASHTO T 182
	BS	
1	Psychical requirements for GSB	BS:812(Part -3)

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RATE ANALYSIS

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BRUHAT BENGALURU MAHANAGARA PALIKE

Executive Engineer Yelahanka Division

Name of Work: Restoration and Improvements of Channamma and Narayanappa layout, Narayanagowda layout, Basavalingappa layout and surrounding areas in ward no -03 of Yelahanka New town Sub division (PACKAGE NO-11)"

Rate Analysis

Sl. No.	Description	Unit	Item no.	Page No	Basic Rate	Lead	Area Weightage (3%)	Final Rate
	1	2	3	4	5	6	7	8
1	KSRRB M300-14. Excavation for roadwork in soil with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading to tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embarnkemnt location to a lead of 1.00 km and complete as per specifications MORTH Specification No.301 (I No-19.14,P No-143)	cum	Item No.19.1	page no .143	41.00	20.48	2.46	63.94
2	KSRRB 300-58. Compaction of original ground by mechanical means including filling in depression occuring during rolling including cost of all labour, HOM complete as per specifications.(I No-19.64,P No-147)	Sqm	I No-19.64	,P No-147	6.00	0.00	0.36	6.36
3	Construction of granular sub-base Grading-V as Sub-base and drainage layer by providing coarse graded crushed stone aggregates of granite/ trap/basalt material, mixing in a mechanical mix plant at OMC, Carriage of mixed material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the 98 % proctor density, complete as per specifications Clause 401 of MORTH V Revision.(I No-20.5,P No-153)	cum	I No-20.5	P No-153	1882.00	0.00	112.92	1994.92
4	KSRRB M600-1.Providing and Constructing dry lean cement concrete mix CC 1:5:10 base with OPC 25mm and down size graded granite metal coarse aggregate at 0.86cum and 0.86cum and fine aggregate @0.58cum over a prepared sub-base,coarse and fine aggregate conforming to IS: 383-2016,aggregate cement ratio not to exceed 15:1.Aggregate gradation after blending to be as per Table 600-1,optimum moisture content to be determind during trial length construction,concrete strength not be determinde during trial length costruction, concrete strength not to be less than 10Mpa at 7 days,mixed in a batching plant,transported to site,laid with a paver,compacting with 8-10 tonnes vibratory roller, finishing and curing complete as per spectications. Clause 601 of MORTH V Revision and IS 456 Table-5 , with OPC at 150 kg/cum and coarse aggregate 0.86 cum,fine aggregate 0.58 cum using concrete Batch mix Plant at 75 cum/hr capacity with fixed form paver 22.1.2,Pg No.-174 ..	cum	Item No 22.1.2	Page No174	4916.00	399.38	229.88	5545.27

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5	Constructing un-reinforced,plain cement concrete for pavements using Grade concrete M30 over a prepared base with OPC coarse aggregate at 0.69 cum,fine aggregates at 0.46 cum,coarse and fine aggregate conforming to IS:383-2016,with Superplastizer at 3 lts conform ng to IS 9103-2008,mixed in a concrete mixer of not less than 0.6 cum capacity and appropriate weigh batcher as per approved mix design,laid in approved fixed side form work (sreel channel,layning and fixing of 125 micron thick polythene fim, wedges, steel plates including levelling the form work as per drawing). & Speration the concrete with shovels, rackers compactec using needle, screed and plate vibrator and finished with floaters in a construction and longitudinal joints,inducing groove cutting charges,joint filler,separation membrane of impermiable plastic sheet of 125 micron,sealant primer, joint sealant, admixtures as approved, curring compound, finishing to lines and grades, textured with texturing machine, and curing including cost of all materials,labour,hire charges of machineries , all lead & lift charges etc., complete as per specifications.with OPC AT 360 kg/cum and coarse aggregate 0.69,fineaggregate 0.46cum. Item No.-22.6.3,Page No.-176	Sqm	Item No 22.6.3	Page No176	4916.00	369.38	318.62	5604.31
6	KSRB 4-1.6: Providing and laying in postion **Plain cement concrete of Mix 1:2:4 with OPC @ 240kgs,** with 20mm and down size graded granite metal coarse aggregates @ 0.87t cum and fine aggregates @ 0.53cum, machine mixed, concrete laid in layers not exceeding 15cms, thick, well compacted, in **foundation, plinth and cills**, including cost of all materials, labour, HOM curing complete as per specifications. Specification No. KBS 4.1, 4.2 Page No-13, Item No-4.6 (PWD BCSR 2018-19)	Sqm	Item No - 4.6	Page No-13,	5422.00	286.26	341.30	6023.56
7	KSRB 4-1.3 : Providing and laying in position **plain cement concrete o/g Mix 1:4:8 with** opc @190kgs, with 40mm and down size graded granite metal coarse aggregates@0.85 cum and fine aggregates @0.57 cum machine mixed , machine mixed, concrete laid in layers not exceeding 15cms. thick, well compacted, in foundation, including cost of all materials, labour, HOM curing complete as per Specifications. Specifications No. KBS 4.1 , 4.2 ,Pg.No 30	cum	Item No.4.2	Pg.No 30	5102.00	199.69	312.10	5613.79
8	KSRRB 300 - Excavation for road, drains and similar works KSRRB 300-1. Earthwork excavation by manual means in ordinary soil involving an average horizontal throw upto 2 meters and an average lift upto 0.5 m, excavated surface leveled and sides neatly dressed, the disposed earth to be leveled neatly after breaking of clods complete as per specifications. MORTH / Chapter 3 (P.No-143, I.No-19.1)	Sqm	I.No-19.1)	P.No-143	130.00	77.48	7.80	215.28

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9	Providing and laying plain/reinforced cement concrete for side drains using M20 nominal mix concrete with OPC at 300 kgs. with 20mm and down size granite metal coarse aggregates at 0.69 cum and fine aggregates at 0.43 cum machine mixed, well compacted for walls and bottom including centering, shuttering, cost of materials, HOM of machinery, curing etc., complete excluding cost of steel as per MORTH specification No. 1500, 1700, 2200. including cost of materials, labour, HOM complete as per specifications. Wall and Bottom Thickness 15 cm , Item No.37.59.2, Page No.271.-	Cum	Item No.37.59.2	Page No.271.	6670.00	332.82	420.17	7422.99
10	KSRRB M 2200-6 Providing T.M.T steel reinforcement for R.C.C work including straightening, cutting, bending, hooking, placing in position, lapping and or welding wherever required, tying with binding wire and anchoring to the adjoining members wherever necessary complete as per design (laps, hooks and wastage shall not be measured and paid) cost of materials, labour, HOM of machinery complete as per specifications. Specification No. MORTH Specification No 1600 & 2200 TMT Bars Fe 500 Page No 229 Item No 28.8.2 SR 2018-19	Tn	Item No. 28.8.2	Page No.229.	80146.60	0.00	0.00	80146.60
11	Providing and Fixing pre cast covering Slab of 100mm thick made out of CC jelly 20mm and down size with steel reinforecement , inclunding form work, lift charges, curing Including cost of all materials ,Labour,Hire charges of machinerles,loading onloading,lead and lift,Transportation etc,complete. as per Engineer in-charge.(Date rate)	Sqm	Approved Data Rate					1922.00
12	Providing and fixing RCC precast cover slab of 230mm thick for drain in cement concrete 1:1.5:3 using graded granite jelly 20mm and down size with steel reinforcement, including form work, lift charges, curing and concrete finished surfaces on both sides etc, complete and as per drawing and the directions of Engineer in-charge. (Data Rate)	Sqm	Approved Data Rate					4486.00
13	Providing and fixing pre cast solid cement concrete kerb stones made out of C.C 1:2:4 with top and bottom width 114 and 165 mm respectively , 400mm high and 450mm in length finished with CM 1:3 plastering and finishing cutting, including form work, curing, including cost of all materials , labour,hire charges of machinery, loading, unloading, lead and lift, transportation ect., complete.I.No.-5.30,P.No-27 of PWD BCSR 2018-19 .	No's	Item No. 5.30	Page No.27	408.00	0.00	24.48	432.48
14	KSRRB 800-1. Painting two coats after filling the surface with synthetic enamel paint in approved shades on new plastered concrete surfaces, with materials, labour complete as per specifications. MORTH Chapter 8 ,Specification No.KSRRB M800 - 6.P.No.180,I.No-24.1 of PW,P & IWTD SR 2018-19 ,	Sqm	Item No. 24.1	Page No.180.	80.00	0.00	4.80	84.80

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15	KSRRB M400-17. Providing, laying, spreading and compacting crushed stone aggregates of granite / trap / basalt to wet mix macadam specifications including pre mixing the material with water at OMC in mechanical mix plant carriage of mixed materials by tipper to site, laying in uniform layers with paver in sub-base/base course on well prepared surface and compacting with vibratory roller to achieve the desired density complete as per specifications (P.No.-155,I.No.-20.18)	Cum	Item No. 20.18	Page No.155	1888.00	0.00	113.28	2001.28
16	KSRRB M500-6. Providing and applying primer coat with S.S. bitumen emulsion on prepared surface of granular base such as WMM including cleaning of road surface and sparying primer at the rte of 0.60 kg /sqm using mechanical means complete as per specifications .Clause 502 of MoRTH V th Revision (pg No.158 I.No-21.6), Issue Rate	Sqm	Item No. 21.6	Page No.158	32.00	0.00	1.92	33.92
17	KSRRB 500-7. Providing and applying tack coat using 80/100 grade bitumen (VG10) on the prepared black topped surfaces at 2.5 kg per 10sqm, heating bitumen in boiler fitted with spray set (excluding cleaning of road surface) including cost of materials , labour, HOM complete as per specification P.No.-155,I.No-21.7,Issue Rate	Sqm	Item No. 21.7	Page No.158	12.00	0.00	0.72	12.72
18	KSRRB M500-17. Providing and laying Dense Graded Bituminous Macadam using crushed aggregates of specified grading, premixed with VG30 grade bituminous binder and. transporting the hot mix to work site, laying to the required grade, level and alignment rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction in all respects complete as per specifications. clause 505 of MORTH V revisionusing 40/60 TPH capacity H.M.P. with mechanical paver Gr-II (50mm to 75mm) with 4.5% VG-30 bitumen with all lead and lift and as per the direction of Engineer in-charge.I.No. 21.17.6,Pg No.- 160 ,Data Rate	cum	Item No. 21.17.6	Page No.160	6880.00	0.00	412.80	7292.80

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19	Providing and laying bituminous concrete using crushed aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot mix to work site, laying with a paver finisher to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction in all respects complete as per specifications. Clause 507 of MORTH V revision - using 40-60 TPH capacity HMP with mechanical paver grading II (30-40mm) with 5.4% of VG-30 bitumen. Page no-162 It. No - 21.22.6	cum	Item No. 21.22.6	Page No.162	7972.00	0.00	478.32	8450.32
20	KSRRB M/00-13. Road Marking with Hot Applied Thermoplastic Compound with Reflectorising Glass Beads on Bituminous Surface / Concrete Surface - Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads at 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC 35. The finished surface to be level, uniform and free from streaks and holes complete as per specifications. MoRTH Specifications No.803(Pg No-182,) No 24.15.	Sqm	Item No. 24.15,	Page No.182	1890.75	0.00	0.00	1890.75
21	KSRRB M/00-35. Supply and Installtion of Moulded Shank Raised Pavement Markers made of polycarbonate and ABS(Acrylonitrile Butadiene Styrene) moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg tested in accordance to Specifications of Category A of MORTH Circular No RW/NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50 mm, 100 mm and 102 mm and with minimum reflective area of 13 Sqcm on each side and the slope to the base shall be 35 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 mm and height not less than 30 mm) from the body is to be a minimum value of 500 Kg. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer (Page No 187 Item No.24.41), SOR 2018-19	No	Item No 24.41,	Page No.187	337.00	0.00	20.22	357.22

CERTIFICATE:

1 The work spot has been inspected by me and the work is found to be necessary.
2 The estimate is prepared as per PW, P&IWTD S.R Bangalore circle for the year 2018-2019.
3 The Provisions made in the estimate are quite necessary and adequate.
4 The area comes with in the BBMP limits.

Assistant Engineer
Ward No-03
BBMP

Assistant Executive Engineer
Yelahanka New Town Sub Divison
BBMP

Executive Engineer
Yelahanka Division
BBMP

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ABSTRACT

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BRUHAT BENGALURU MAHANAGARA PALIKE

Executive Engineer Yelahanka Division

Name of Work: Restoration and Improvements of Channamma and Narayanappa layout, Narayanagowda layout, Basavalingappa layout and surrounding areas in ward no -03 of Yelahanka New town Sub division (PACKAGE NO-11)"

Abstract Cost Estimation

Sl. No.	Description	Unit	Total Qty.	Rate	Amount
	1	2	3	4	5
1	KSRRB M300-14. Excavation for roadwork in all types of soil by mechanical means including cutting and loading to tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transportation with a lead of 1.00 km and complete as per specifications MORTH Specificatio MORTH Specification No.301Loading and unloading with 10km lead= (I No-19.14,P No-143)	cum	7680.00	63.94	658537.24
2	KSRRB 300-58. Compaction of original ground by mechanical means including filling in depression occuring during rolling including cost of all labour, HOM complete as per specifications.(I No-19.64,P No-147)	Sqm	25705.00	6.36	218345.16
3	Construction of granular sub-base Grading-V as Sub-base and drainage layer by providing coarse graded crushed stone aggregates of granite/ trap/basalt material, mixing in a mechanical mix plant at OMC, Carriage of mixed material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the 98 % proctor density, complete as per specifications Clause 401 of MORTH V Revision.(I No-20.5,P No-153)	cum	8587.63	1994.92	17125390.74

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4	KSRRB M600-1.Providing and Constructing dry lean cement concrete mix CC 1:5:10 base with OPC 25mm and down size graded granite metal coarse aggregate at 0.86cum and 0.86cum and fine aggregate @0.58cum over a prepared sub-base,coarse and fine aggregate conforming to IS: 383-2016,aggregate cement ratio not to exceed 15:1.Aggregate gradation after blending to be as per Table 600-1,optimum moisture content to be determind during trial length construction,concrete strength not be determinde during trial length costruction, concrete strength not to be less than 10Mpa at 7 days,mixed in a batching plant,transported to site,laid with a paver,compacting with 8-10 tonnes vibratory roller, finishing and curing complete as per spectications. Clause 601 of MORTH V Revision and IS 456 Table-5 , with OPC at 150 kg/cum and coarse aggregate 0.86 cum,fine aggregate 0.58 cum using concrete Batch mix Plant at 75 cum/hr capacity with fixed form paver 22.1.2,Pg No.-174 ..	cum	2148.60	4061.29	10168669.42
5	Constructing un-reinforced,plain cement concrete for pavements using Grade concrete M30 over a prepared base with OPC coarse aggregate at 0.69 cum,fine aggregates at 0.46 cum,coarse and fine aggregate conforming to IS:383-2016,with Superplastizer at 3 lts conforming to IS 9103-2008.mixed in a concrete mixer of not less than 0.6 cum capacity and appropriate weigh batcher as per approved mix design.laid in approved fixed side form work (sreel channel,layning and fixing of 125 micron thick polythene fim, wedges, steel plates including levelling the form work as per drawing). & Speration the concrete with shovels, rackers compacted using needle, screed and plate vibrator and finished with floaters in a construction and longitudinal joints,including groove cutting charges,joint filler,separation membrane of impermiable plastic sheet of 125 micron,sealant primer, joint sealant, admixtures as approved, curring compound, finishing to lines and grades, textured with texturing machine, and curing including cost of all materials,labour,hire charges of machineries , all lead & lift charges etc., complete as per specifications.with OPC AT 360 kg/cum and coarse	cum	2138.48	5634.31	14107177.97

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6	KSRB 4-1.6: Providing and laying in postion **Plain cement concrete of Mix 1:2:4 with OPC @ 240kgs,** with 20mm and down size graded granite metal coarse aggregates @ 0.878 cum and fine aggregates @ 0.53cum, machine mixed, concrete laid in layers not exceeding 15cms, thick, well compacted, in **foundation, plinth and cills**, including cost of all materials, labour, HOM curing complete as per specifications. Specification No. KBS 4.1, 4.2 Page No-13, Item No-4.6 (PWD BCSR 2018-19)	Cum	65.42	6029.55	457642.95
7	KSRB 4-1.3 : Providing and laying in position **plain cement concrete ofg Mix 1:4:8 with** opc @180kgs, with 40mm and down size graded granite metal coarse aggregates@0.85 cum and fine aggregates @0.57 cum machine mixed , machine mixed, concrete laid in layers mot exceeding 15cms. thick, well compacted, in foundation, including cost of all materials, labour, HOM curing complete as per Specifications. Specifications No. KBS 4.1 , 4.2 ,Pg.No 30	**cum**	2673.71	5619.79	2504039.50
8	KSRRB 300 - Excavation for road, drains and similar works KSRRB 300-1. Earthwork excavation by manual means in ordinary soil involving an average horizontal throw upto 2 meters and an average lift upto 0.5 m, excavated surface leveled and sides neatly dressed, the disposed earth to be leveled neatly after breaking of clods complete as per specifications. MORTH / Chapter 3 (P.No-143, I.No-19.1)	Cum	2473.61	215.28	647274.30
9	Providing and laying plain/reinforced cement concrete for side drains using M20 nominal mix concrete with OPC at 300 kgs. with 20mm and down size granite metal coarse aggregates at 0.69 cum and fine aggregates at 0.43 cum machine mixed, well compacted for walls and bottom including centering, shuttering, cost of materials, HOM of machinery, curing etc., complete excluding cost of steel as per MORTH specification No. 1500, 1700, 2200. including cost of materials, labour, HOM complete as per specifications. Wall and Bottom Thickness 15 cm , Item No.37.59.2, Page No.271.-	**Cum**	570.27	7422.99	6333053.14

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10	KSRRB M 2200-6 Providing T.M.T steel reinforcement for R.C.C work including straightening, cutting, bending, hooking, placing in position, lapping and or welding wherever required, tying with binding wire and anchoring to the adjoining members wherever necessary complete as per design (laps, hooks and wastage shall not be measured and paid) cost of materials, labour, HOM of machinery complete as per specifications. Specification No. MORTH Specification No 1600 & 2200 TMT Bars Fe 500 Page No 229 Item No 28.8.2 SR 2018-19	Tn	35.87	80146.60	4240789.03
11	Providing and Fixing pre cast covering Slab of 100mm thick made out of CC jelly 20mm and down size with steel reinforecement , inclunding form work, lift charges, curing including cost of all materials ,Labour,Hire charges of machineries,loading onloading,lead and lift,Transportation etc,complete. as per Engineer in-charge.(Date rate)	Sqm	1728.90	1922.00	4212063.00
12	Providing and fixing RCC precast cover slab of 230mm thick for drain in cement concrete 1:1.5:3 using graded granite jelly 20mm and down size with steel reinforcement, including form work, lift charges, curing and concrete finished surfaces on both sides etc, complete and as per drawing and the directions of Engineer in-charge. (Data Rate)	Sqm	270.60	4486.00	985125.60
13	Providing and fixing pre cast solid cement concrete kerb stones made out of C.C 1:2:4 with top and bottom width 114 and 165 mm respectively , 400mm high and 450mm in length finished with CM 1:3 plastering and finishing cutting, including form work, curing, including cost of all materials , labour,hire charges of machinery, loading, unloading, lead and lift, transportation ect., complete.I.No.-5.30,P.No-27 of PWD BCSR 2018-19 .	No's	7846.67	432.48	4031674.67
14	KSRRB 800-1. Painting two coats after filling the surface with synthetic enamel paint in approved shades on new plastered concrete surfaces, with materials, labour complete as per specifications. MORTH Chapter 8 ,Specification No.KSRRB M800 -6.P.No.180,I.No-24.1 of PW,P & IWTD SR 2018-19 ,	Sqm	1545.60	84.80	161192.08

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15	KSRRB M400-17. Providing, laying, spreading and compacting crushed stone aggregates of granite / trap / basalt to wet mix macadam specifications including pre mixing the material with water at OMC in mechanical mix plant carriage of mixed materials by tipper to site, laying in uniform layers with paver in sub-base/base course on well prepared surface and compacting with vibratory roller to achieve the desired density complete as per specifications (P.No.-155,I.No.-20.18)	**Cum**	2276.20	2001.28	7060115.58
16	KSRRB M500-6. Providing and applying primer coat with S.S. bitumen emulsion on prepared surface of granular base such as WMM including cleaning of road surface and sparying primer at the rte of 0.60 kg /sqm using mechanical means complete as per specifications .Clause 502 of MoRTH V th Revision (pg No.158 I.No-21.6), Issue Rate	**Sqm**	11381.00	33.92	598314.88
17	KSRRB 500-7. Providing and applying tack coat using 80/100 grade bitumen (VG10) on the prepared black topped surfaces at 2.5 kg per 10sqm, heating bitumen in boiler fitted with spray set (excluding cleaning of road surface) including cost of materials , labour, HOM complete as per specification P.No.-158,I.No-21.7,Issue Rate	**Sqm**	11381.00	12.72	224368.08
18	KSRRB M500-17. Providing and laying Dense Graded Bituminous Macadam using crushed aggregates of specified grading, premixed with VG30 grade bituminous binder and, transporting the hot mix to work site, laying to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction in all respects complete as per specifications. clause 505 of MORTH V revisionusing 40/60 TPH capacity H.M.P. with mechanical paver Gr-II (50mm to 75mm) with 4.5% VG-30 bitumen with all lead and lift and as per the direction of Engineer in-charge.I.No.-21.17.6,Pg.No.- 160 ,Data Rate	**cum**	569.05	7292.80	6431884.96

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19	Providing and laying Bituminous concrete , using crushed aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot mix to work site, laying with a paver finisher to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction in all respects complete as per specifications. Clause 507 of MORTH V revision - using 40-60 TPH capacity HMP with mechanical paver grading II (30-40mm) with 5.4% of VG-30 bitumen .	**cum**	455.24	8450.32	5962207.78
20	KSRRB M800-13. Road Marking with Hot Applied 'Thermoplastic Compound with Reflectrising Glass Beads on Bituminous Surface / Concrete Surface :- Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads at 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35. The finished surface to be level, uniform and free from streaks and holes complete as per specifications .MoRTH Specifications No.803(Pg.No-182,I.No.24.15,	**Sqm**	1533.48	454.74	859799.66
21	KSRRB M800-35. Supply and Installtion of Moulded Shank Raised Pavement Markers made of polycarbonate and ABS(Acrylonitrile Butadiene Styrene) moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg tested in accordance to Specifications of Category A of MORTH Circular No RW/ NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50 mm, 100 mm and 102 mm and with minimum reflective area of 13 Sqcm on each side and the slope to the base shall be 35 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 mm and height not less than 30 mm) from the body is to be a minimum value of 500 Kg. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer (Page No.187. Item No.24.41), SOR 2018-19	**No**	2543.48	357.22	480639.51

AARTN ASSOCIATES BANGALORE DATE

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total construction cost	87466305.24
12 % GST	10496196.63
Sub total	97964501.87
DPR 1%	1000000.00
PMC 1%	1000000.00
Miscellaneous & Rounding off	35498.13
Total Amount	100000000.00

CERTIFICATE:

1 The work spot has been inspected by me and the work is found to be necessary.
2 The estimate is prepared as per PW, P&IWTD S.R Bangalore circle for the year 2018-2019.
3 The Provisions made in the estimate are quite necessary and adequate.
4 The area comes with in the BBMP limits.

AARTN ASSOCIATES DATE BANGALORE

Assistant Engineer
Ward No-03
BBMP

Assistant Executive Engineer
Yelahanka New Town Sub Divison
BBMP

Executive Engineer
Yelahanka Division
BBMP

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DRAFT TENDER SCHEDULE

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BRUHAT BENGALURU MAHANAGARA PALIKE

Executive Engineer Yelahanka Division

Name of Work: "Consultancy Service for Detailed Project Report, Field Survey, General Report, Basic Drawing, Technical Report, Detailed Drawing, Detailed Cost Estimate for Restoration and Improvements of Channamma and Narayanappa layout, Narayanagowda layout, Basavalingappa layout and surrounding areas in ward no -03 of Yelahanka New town Sub division (PACKAGE NO-11)"

Draft Tender Schedule

Item No.	Description	Unit	Quantity	Rate, Rs		Amount
				In Figures	In Words	
1	KSRRB M300-14. Excavation for roadwork in all types of soil by mechanical means including cutting and loading to tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transportation with a lead of 1.00 km and complete as per specifications MORTH Specificatio MORTH Specification No.301Loading and unloading with 10km lead= (I No-19.14,P No-143)	cum	10299.30	63.94	sixty three Rupees and ninety four pais	658537.24
2	KSRRB 300-58. Compaction of original ground by mechanical means including filling in depression occuring during rolling including cost of all labour, HOM complete as per specifications.(I No-19.64,P No-147)	Sqm	34331.00	6.36	six Rupees and thirty six paisa only	218345.16
3	Construction of granular sub-base Grading-V as Sub-base and drainage layer by providing coarse graded crushed stone aggregates of granite/ trap/basalt material, mixing in a mechanical mix plant at OMC, Carriage of mixed material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the 98 % proctor density, complete as per specifications Clause 401 of MORTH V Revision.(I No-20.5,P No-153)	cum	8584.50	1994.92	one thousand nine hundred ninety four Rupees and ninety two paisa only	17125390.74
4	KSRRB M600-1.Providing and Constructing dry lean cement concrete mix CC 1:5:10 base with OPC 25mm and down size graded granite metal coarse aggregate at 0.86cum and 0.86cum and fine aggregate @0.58cum over a prepared sub-base,coarse and fine aggregate conforming to IS: 383-2016,aggregate cement ratio not to exceed 15:1.Aggregate gradation after blending to be as per Table 600-1,optimum moisture content to be determind during trial length construction,concrete strength not be determinde during trial length costruction, concrete strength not to be less than 10Mpa at 7 days,mixed in a batching plant,transported to site,laid with a paver,compacting with 8-10 tonnes vibratory roller, finishing and curing complete as per spectications. Clause 601 of MORTH V Revision and IS 456 Table-5 , with OPC at 150 kg/cum and coarse aggregate 0.86 cum,fine aggregate 0.58 cum using concrete Batch mix Plant at 75 cum/hr capacity with fixed form paver 22.1.2,Pg No.-174 ..	cum	2503.80	4061.29	four thousand sixty one Rupees and twenty nine paisa only	10168669.42

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5	Constructing un-reinforced,plain cement concrete for pavements using Grade concrete M30 over a prepared base with OPC coarse aggregate at 0.69 cum,fine aggregates at 0.46 cum,coarse and fine aggregate conforming to IS:383-2016,with Superplastizer at 3 lts conforming to IS 9103-2008.mixed in a concrete mixer of not less than 0.6 cum capacity and appropriate weigh batcher as per approved mix design,laid in approved fixed side form work (sreel channel,layning and fixing of 125 micron thick polythene fim, wedges, steel plates including levelling the form work as per drawing). & Speration the concrete with shovels, rackers compacted using needle, screed and plate vibrator and finished with floaters in a construction and longitudinal joints,including groove cutting charges,joint filler,separation membrane of impermiable plastic sheet of 125 micron,sealant primer, joint sealant, admixtures as approved, curring compound, finishing to lines and grades, textured with texturing machine, and curing including cost of all materials,labour,hire charges of machineries , all lead & lift charges etc., complete as per specifications.with OPC AT 360 kg/cum and coarse aggregate 0.69,fineaggregate 0.46cum.	**cum**	2503.80	5634.31	five thousand six hundred thirty four Rupees and thirty one paisa only
6	KSRB 4-1.6: Providing and laying in postion **Plain cement concrete of Mix 1:2:4 with OPC @ 240kgs,** with 20mm and down size graded granite metal coarse aggregates @ 0.878 cum and fine aggregates @ 0.53cum, machine mixed, concrete laid in layers not exceeding 15cms, thick, well compacted, in **foundation, plinth and cills,** including cost of all materials, labour, HOM curing complete as per specifications. Specification No. KBS 4.1, 4.2 Page No-13, Item No-4.6.,(PWD BCSR 2018-19)	**cum**	75.90	6029.55	six thousand twenty nine Rupees and fifty five paisa only
7	KSRB 4-1.3 : Providing and laying in position **plain cement concrete ofg Mix 1:4:8 with** opc @180kgs, with 40mm and down size graded granite metal coarse aggregates@0.85 cum and fine aggregates @0.57 cum machine mixed , machine mixed, concrete laid in layers mot exceeding 15cms. thick, well compacted, in foundation, including cost of all materials, labour, HOM curing complete as per Specifications.	**cum**	445.58	5619.79	five thousand six hundred nineteen Rupees and seventy nine paisa only
8	KSRRB 300 - Excavation for road, drains and similar works KSRRB 300-1. Earthwork excavation by manual means in ordinary soil involving an average horizontal throw upto 2 meters and an average lift upto 0.5 m, excavated surface leveled and sides neatly dressed, the disposed earth to be leveled neatly after breaking of clods complete as per specifications.	**cum**	3006.66	215.28	two hundred fifteen Rupees and twenty eight paisa only
9	Providing and laying plain/reinforced cement concrete for side drains using M20 nominal mix concrete with OPC at 300 kgs. with 20mm and down size granite metal coarse aggregates at 0.69 cum and fine aggregates at 0.43 cum machine mixed, well compacted for walls and bottom including centering, shuttering, cost of materials, HOM of machinery, curing etc., complete excluding cost of steel as per MORTH specification No. 1500, 1700, 2200. including cost of materials, labour, HOM complete as per specifications. Wall and Bottom Thickness 15 cm.	**Cum**	853.17	7422.99	seven thousand four hundred twenty two Rupees and ninety nine paisa only

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10	KSRRB M 2200-6 Providing T.M.T steel reinforcement for R.C.C work including straightening, cutting, bending, hooking, placing in position, lapping and or welding wherever required, tying with binding wire and anchoring to the adjoining members wherever necessary complete as per design (laps, hooks and wastage shall not be measured and paid) cost of materials, labour, HOM of machinery complete as per specifications. Specification No. MORTH Specification No 1600 & 2200 TMT Bars Fe 500 Page No 229 Item No 28.8.2 SR 2018-19	**Tn**	52.91	80146.60	Eighty thousand one hundred Forty six Rupees and sixty paisa only	4240789.03
11	Providing and Fixing pre cast covering Slab of 100mm thick made out of CC jelly 20mm and down size with steel reinforecement , inclunding form work, lift charges, curing including cost of all materials ,Labour,Hire charges of machineries,loading onloading,lead and lift,Transportation etc,complete. as per Engineer in-charge.(Date rate)	**Sqm**	2191.50	1922.00	One thousand nine hundred twenty two Rupees and zero paisa only	4212063.00
12	Providing and fixing RCC precast cover slab of 230mm thick for drain in cement concrete 1:1.5:3 using graded granite jelly 20mm and down size with steel reinforcement, including form work, lift charges, curing and concrete finished surfaces on both sides etc, complete and as per drawing and the directions of Engineer in-charge. (Data Rate)	**Sqm**	219.60	4486.00	four thousand four hundred eighty six Rupees and zero paisa only	985125.60
13	Providing and fixing pre cast solid cement concrete kerb stones made out of C.C 1:2:4 with top and bottom width 114 and 165 mm respectively , 400mm high and 450mm in length finished with CM 1:3 plastering and finishing cutting, including form work, curing, including cost of all materials , labour,hire charges of machinery, loading, unloading, lead and lift, transportation ect., complete.I.No.-5.30,P.No-27 of PWD BCSR 2018-19 .	**No's**	9322.00	432.48	four hundred thirty two Rupees and forty eight paisa only	4031674.67
14	KSRRB 800-1. Painting two coats after filling the surface with synthetic enamel paint in approved shades on new plastered concrete surfaces, with materials, labour complete as per specifications. MORTH Chapter 8 ,Specification No.KSRRB M800 - 6.P.No.180,I.No-24.1 of PW,P & IWTD SR 2018-19 ,	**Sqm**	1900.85	84.80	eighty four Rupees and eighty paisa only	161192.08
15	KSRRB M400-17. Providing, laying, spreading and compacting crushed stone aggregates of granite / trap / basalt to wet mix macadam specifications including pre mixing the material with water at OMC in mechanical mix plant carriage of mixed materials by tipper to site, laying in uniform layers with paver in sub-base/base course on well prepared surface and compacting with vibratory roller to achieve the desired density complete as per specifications (P.No.-155,I.No.-20.18)	**Cum**	3527.80	2001.28	two thousand one Rupees and twenty eight paisa only	7060115.58

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16	KSRRB M500-6. Providing and applying primer coat with S.S. bitumen emulsion on prepared surface of granular base such as WMM including cleaning of road surface and sparying primer at the rte of 0.60 kg /sqm using mechanical means complete as per specifications .Clause 502 of MoRTH V th Revision (pg No.158 I.No-21.6), Issue Rate	**Sqm**	17639.00	33.92	thirty three Rupees and ninety two paisa only	598314.88
17	KSRRB 500-7. Providing and applying tack coat using 80/100 grade bitumen (VG10) on the prepared black topped surfaces at 2.5 kg per 10sqm, heating bitumen in boiler fitted with spray set (excluding cleaning of road surface) including cost of materials , labour, HOM complete as per specification P.No.-158,I.No-21.7,Issue Rate	**Sqm**	17639.00	12.72	twelve Rupees and seventy two paisa only	224368.08
18	KSRRB M500-17. Providing and laying Dense Graded Bituminous Macadam using crushed aggregates of specified grading, premixed with VG30 grade bituminous binder and, transporting the hot mix to work site, laying to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction in all respects complete as per specifications. clause 505 of MORTH V revisionusing 40/60 TPH capacity H.M.P. with mechanical paver Gr-II (50mm to 75mm) with 4.5% VG-30 bitumen with all lead and lift and as per the direction of Engineer in-charge.I.No.-21.17.6,Pg.No.- 160 ,Data Rate	**cum**	881.95	7292.80	Seven thousand two hundred ninety two Rupees and eighty paisa only	6431884.96
19	Providing and laying Bituminous concrete , using crushed aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot mix to work site, laying with a paver finisher to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction in all respects complete as per specifications. Clause 507 of MORTH V revision - using 40-60 TPH capacity HMP with mechanical paver grading II (30-40mm) with 5.4% of VG-30 bitumen .	**cum**	705.56	8450.32	eight thousand four hundred fifty Rupees and thirty two paisa only	5962207.78
20	KSRRB M800-13. Road Marking with Hot Applied 'Thermoplastic Compound with Reflectrising Glass Beads on Bituminous Surface / Concrete Surface :- Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads at 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35. The finished surface to be level, uniform and free from streaks and holes complete as per specifications .MoRTH Specifications No.803(Pg.No-182,I.No.24.15,	**Sqm**	1890.75	454.74	four hundred fifty four Rupees and seventy four paisa only	859799.66

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21	KSRRB M800-35. Supply and Installtion of Moulded Shank Raised Pavement Markers made of polycarbonate and ABS(Acrylonitrile Butadiene Styrene) moulded body and reflective panels with micro prismatic lens capable of providing total internal reflection of the light entering the lens face and shall support a load of 16000 kg tested in accordance to Specifications of Category A of MORTH Circular No RW/ NH/33023/10-97 - DO III Dt 11.06. 1997. The height, width and length shall not exceed 50 mm, 100 mm and 102 mm and with minimum reflective area of 13 Sqcm on each side and the slope to the base shall be 35 degree. The strength of detachment of the integrated cylindrical shanks, (of diameter not less than 19 mm and height not less than 30 mm) from the body is to be a minimum value of 500 Kg. Fixing will be by drilling holes on the road for the shanks to go inside, without nails and using epoxy resin based adhesive as per manufacturer's recommendation and complete as directed by the engineer (Page No.187. Item No.24.41), SOR 2018-19	No	1345.50	357.22	three hundred fifty seven Rupees and twenty two palsa only	480639.51

"No of correction NIL"

"DTS Approved"

Executive Engineer
Yelahanka Division
BBMP

ಮುಖ್ಯ ಅಭಿಯಂತರರು
ಯಲಹಂಕ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

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PHOTOS

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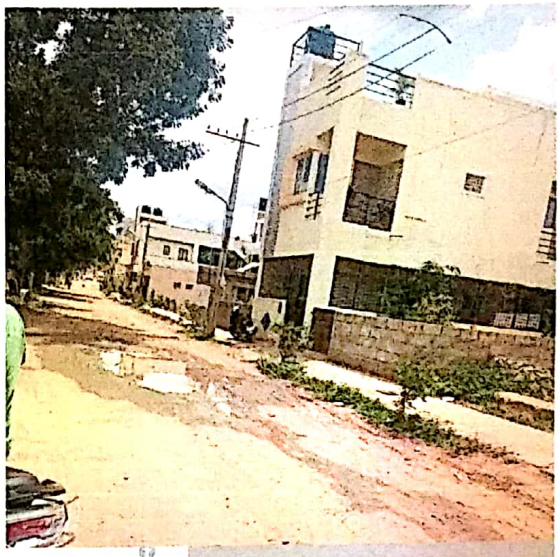
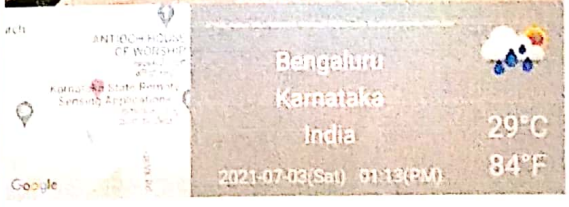
Name of Work:- **Restoration and Improvements of Channamma and Narayanappa layout, and surrounding areas in ward no-03 of Yelahanka Satellite town sub division**

Chennma&naraynappa Layout:-





AARTN ASSOCIATES

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಯಲಹಂಕ ಉಪನಗರ ಉಪವಿಭಾಗ
ಬಿ.ಡಬ್ಲ್ಯು.ಎಸ್.ಎಸ್.ಬಿ. ಬೆಂಗಳೂರು-106

AARTN ASSOCIATES
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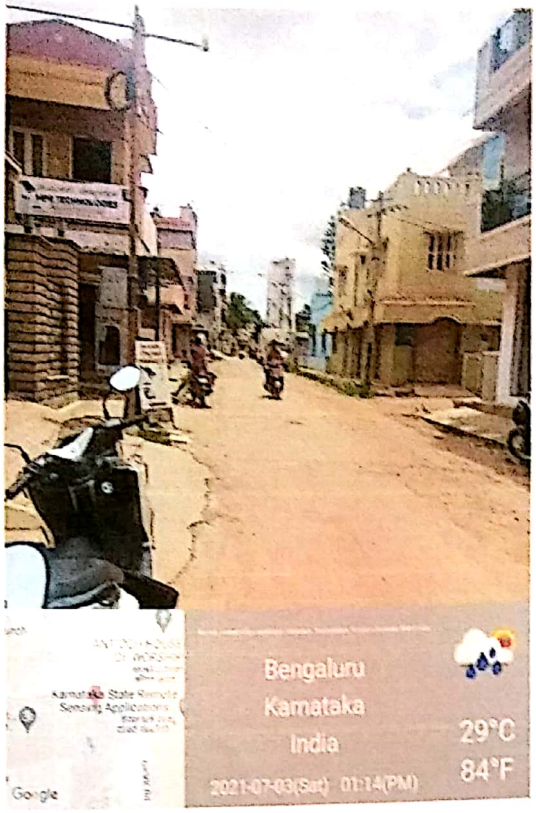
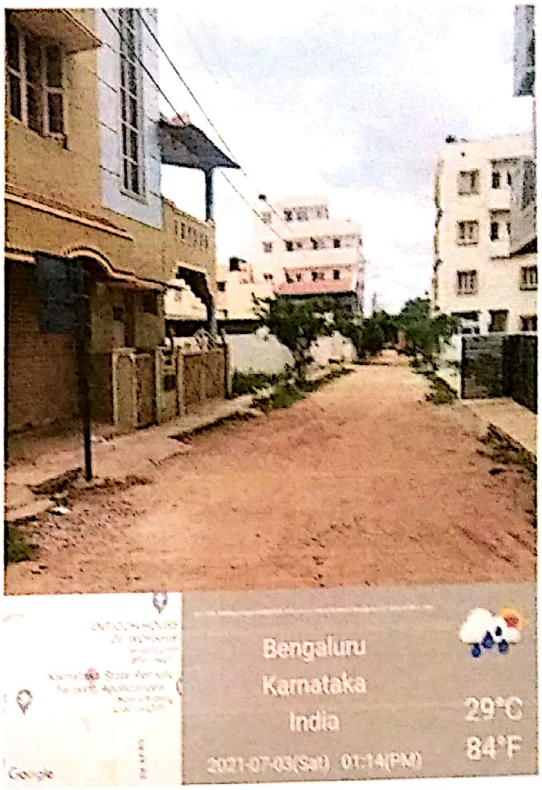
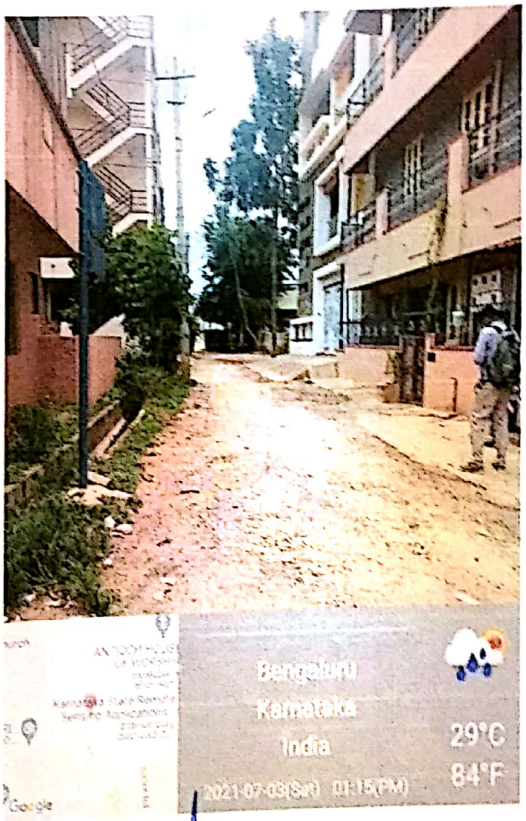
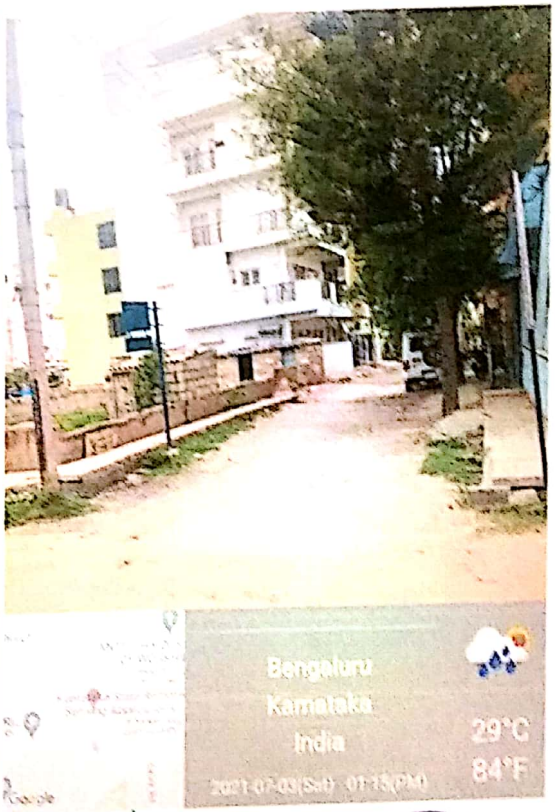
Name of Work:- Restoration and Improvements of Channamma and Narayanappa layout, and surrounding areas in ward no-03 of Yelahanka Satellite town sub division









AARTN ASSOCIATES

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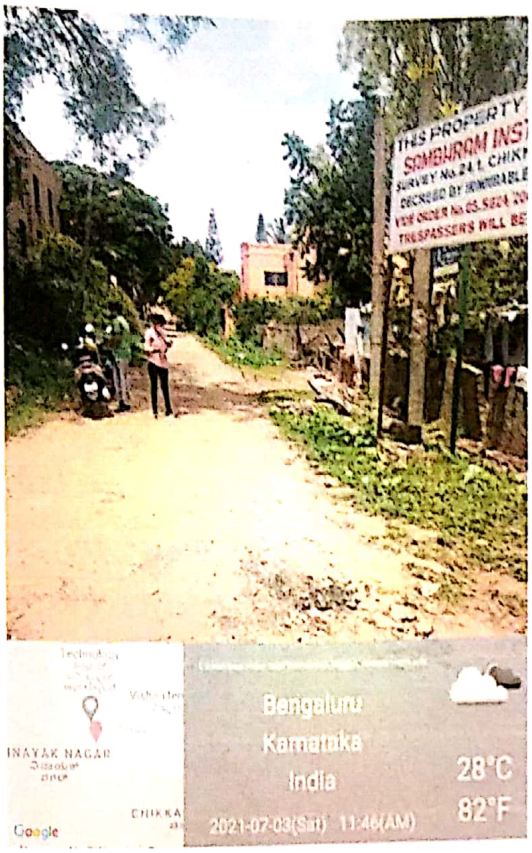
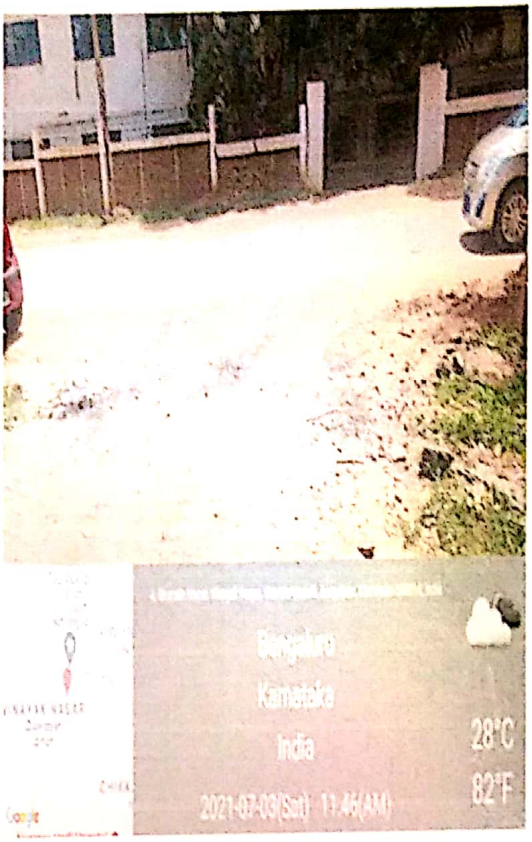
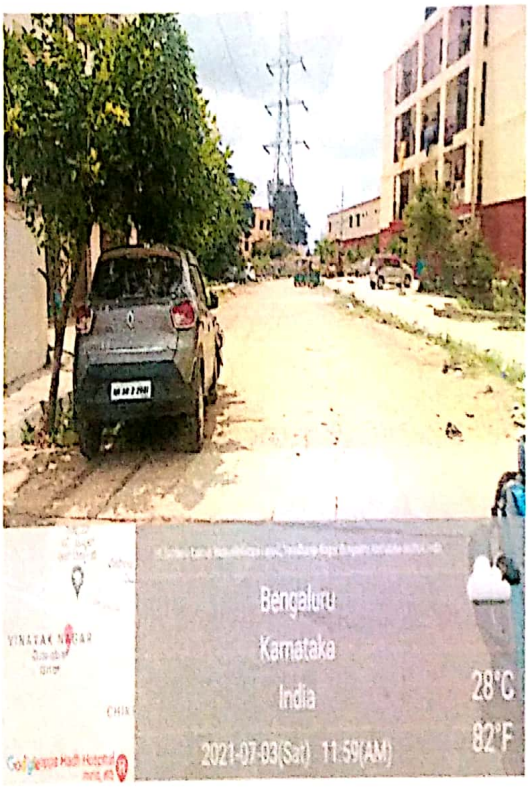
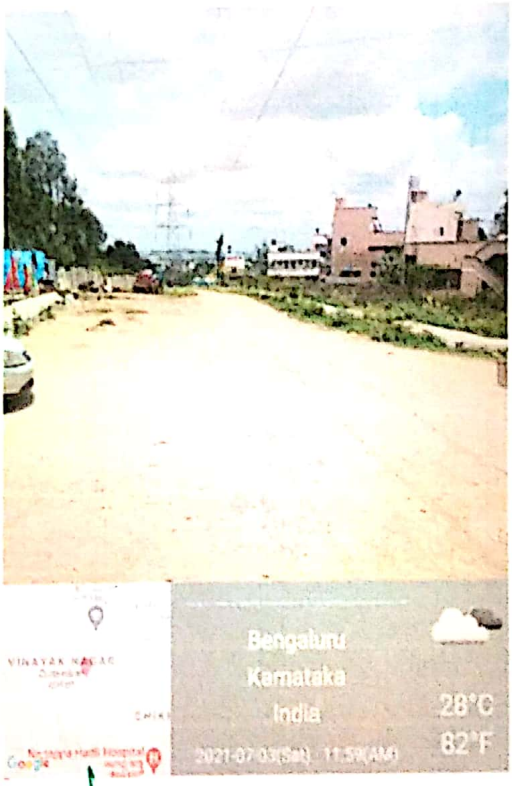
Name of Work:-Restoration and Improvements of Basavalingappa layout and surrounding areas in ward no-03 of Yelahanka Satellite town sub division.

Basavalingappa Layout:-









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AARTN ASSOCIATES DATE BANGALORE

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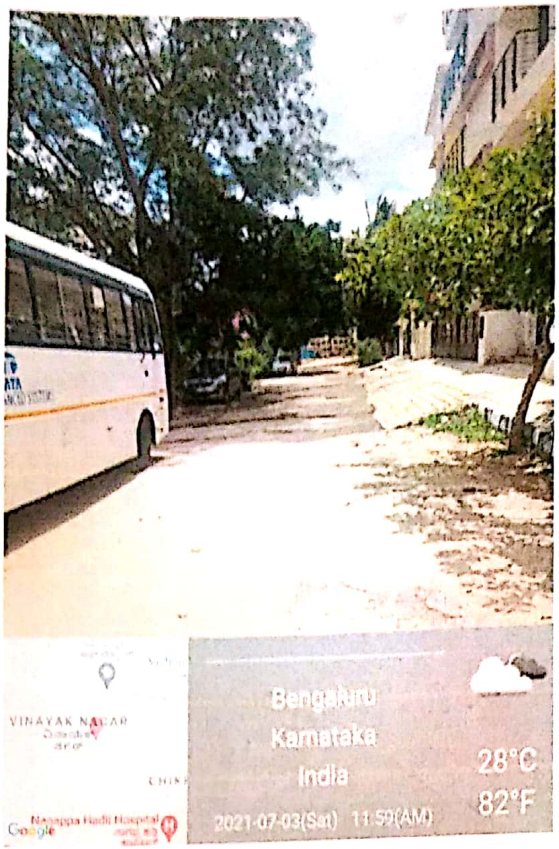
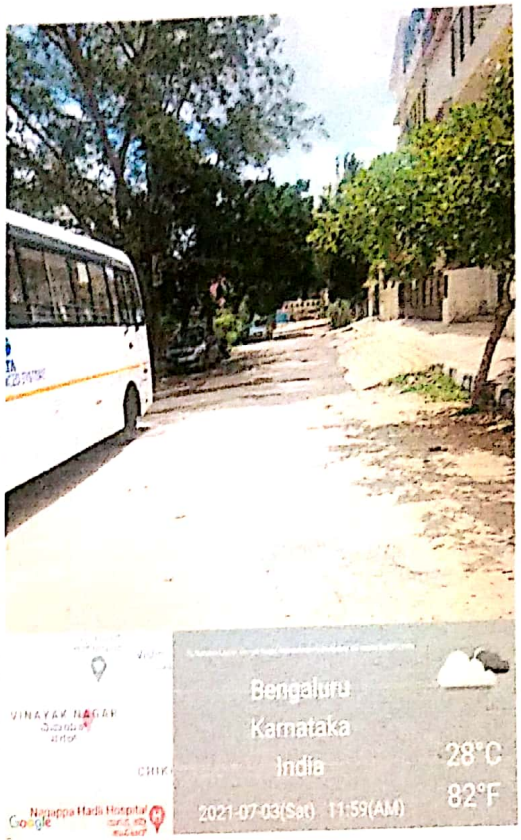
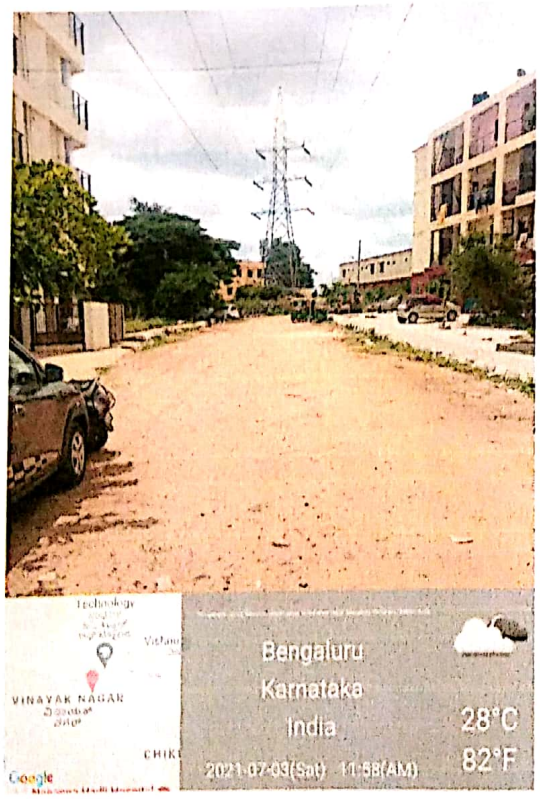
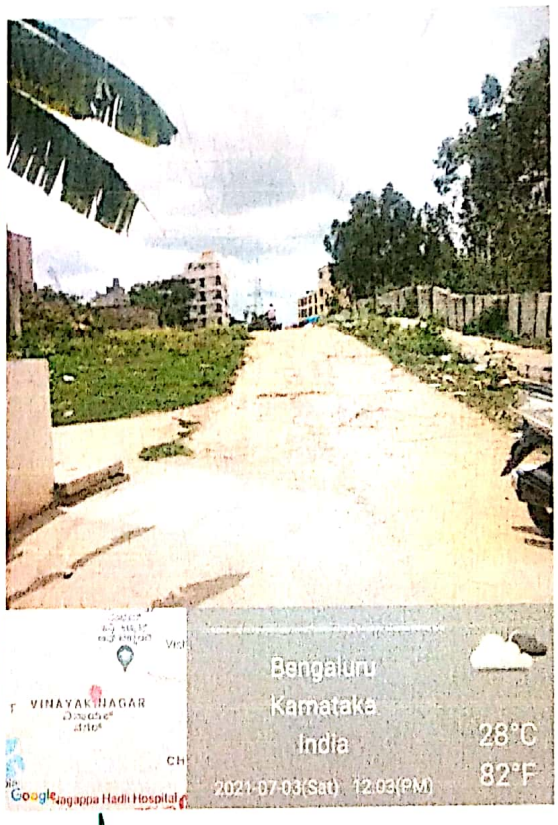
Name of Work:-Restoration and Improvements of Basavalingappa layout and surrounding areas in ward no-03 of Yelahanka Satellite town sub division.









AARTN ASSOCIATES

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ಬೆಂಗಳೂರು-

AARTN ASSOCIATES BANGALORE

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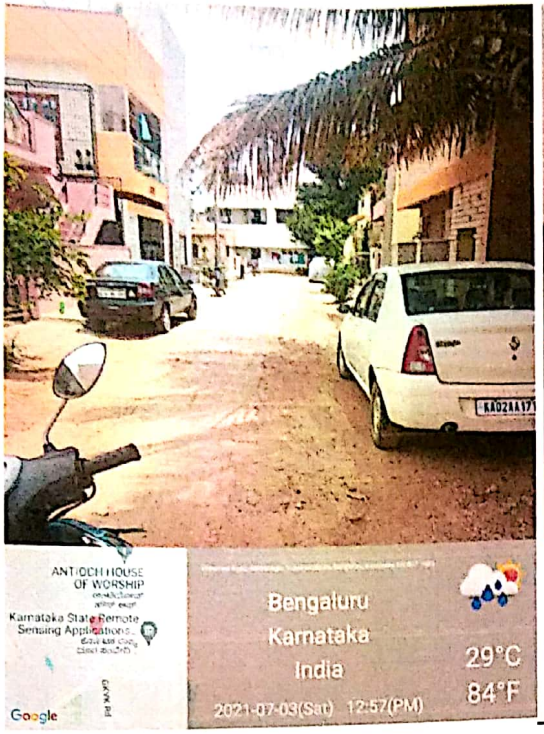
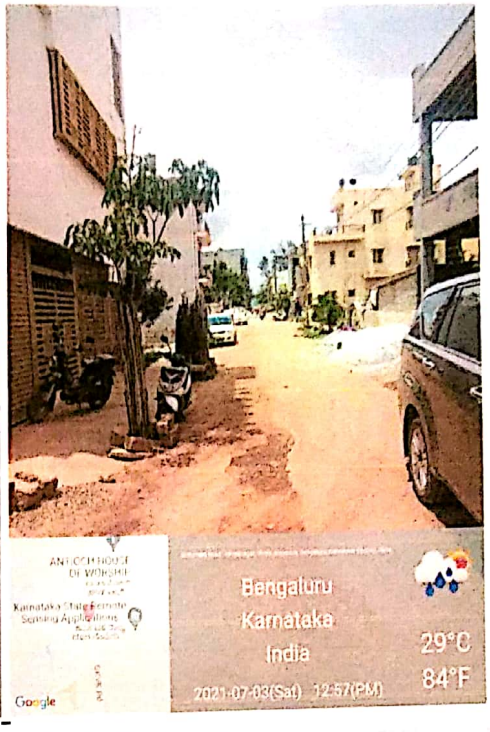
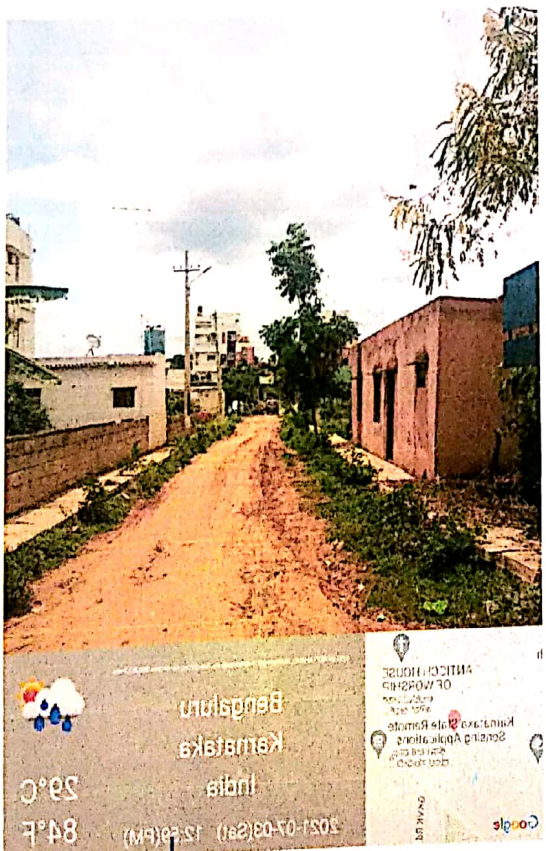
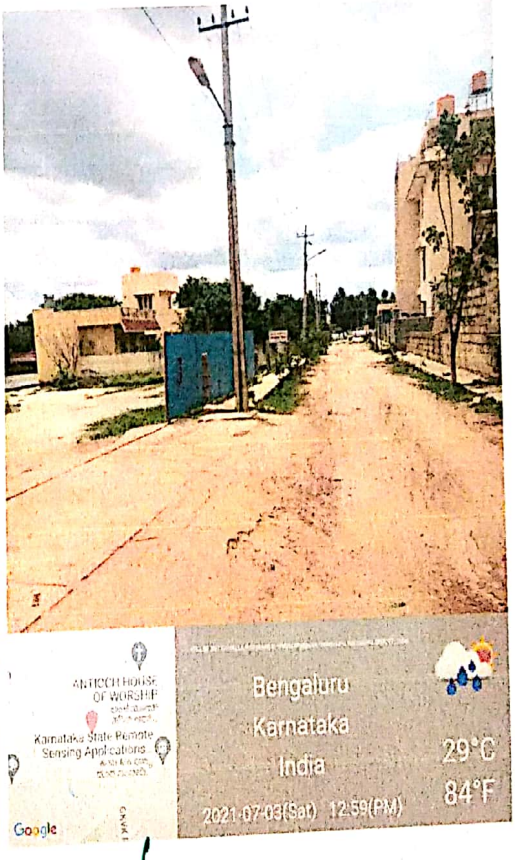
Name of Work:- Restoration and Improvements of Narayanagowda layout,,and surrounding areas in ward no-03 of Yelahanka Satellite town sub division.

Narayana Gowda Layout:-









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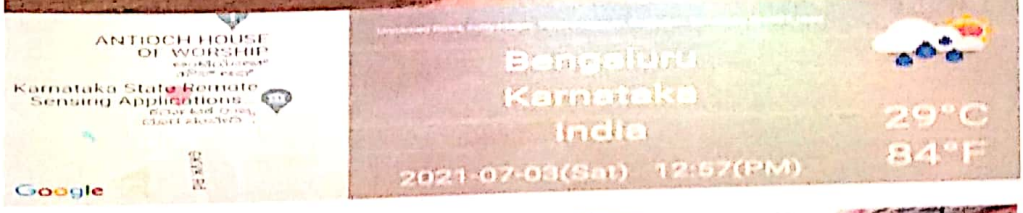
ಬಿ.ಬಿ.ಎಂ.ಪಿ. ಬೆಂಗಳೂರು-106

AARTN ASSOCIATES DATE No BANGALORE

Scanned with CamScanner

Name of Work:- Restoration and Improvements of Narayanagowda layout,,and surrounding areas in ward no-03 of Yelahanka Satellite town sub division.



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ಯಲಹಂಕ ಉಪನಗರ ಉಪವಿಭಾಗ

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KEY MAP

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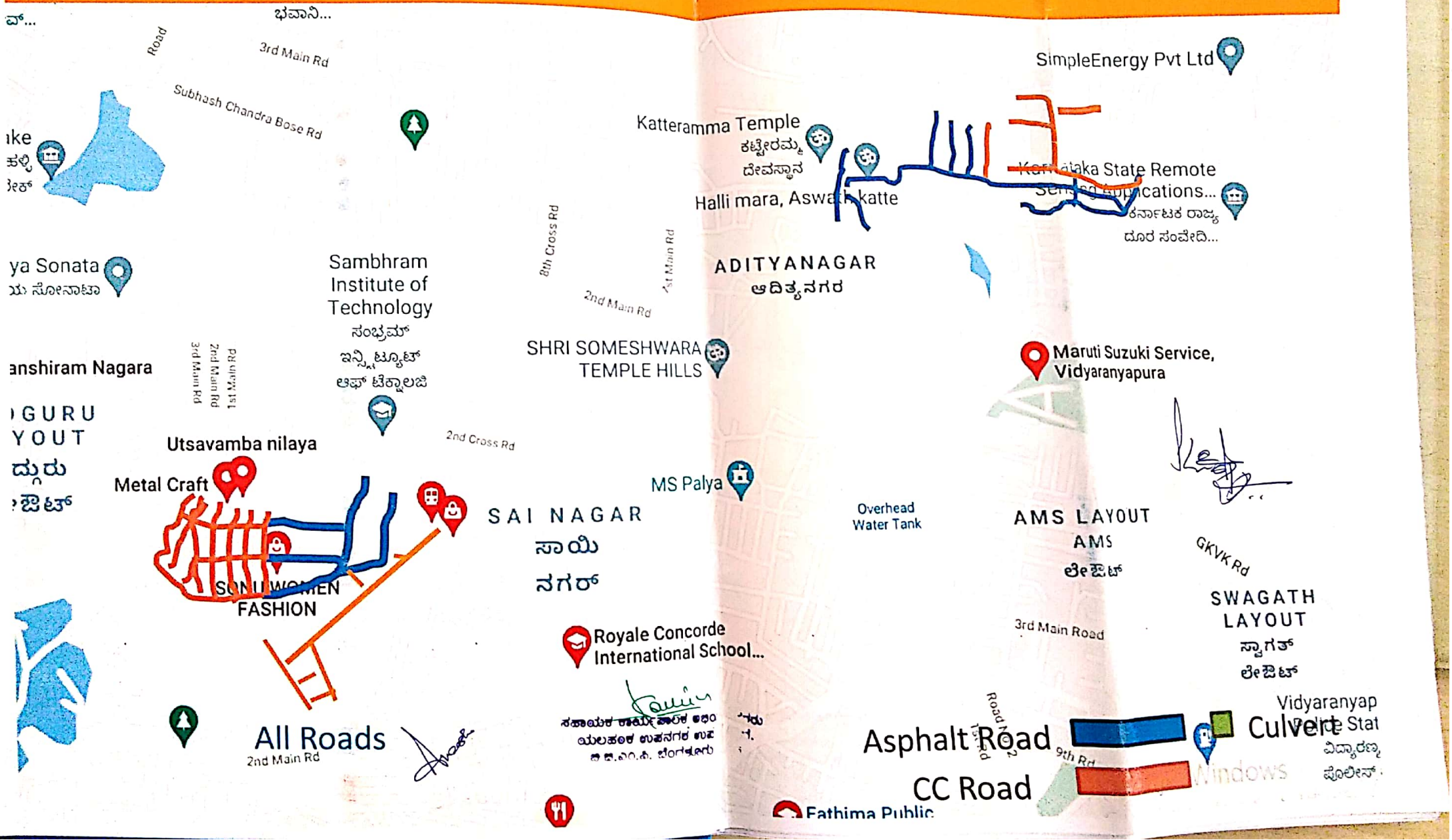
"Consultancy Service for Detailed Project Report, Field Survey, General Report, Basic Drawing, Technical Report, Detailed Drawing, Detailed Cost Estimate for Restoration and Improvements of Channamma and Narayanappa layout, Narayanagowda layout, Basavalingappa layout and surrounding areas in ward no -03 of Yelahanka New town Sub division (PACKAGE NO-11)"



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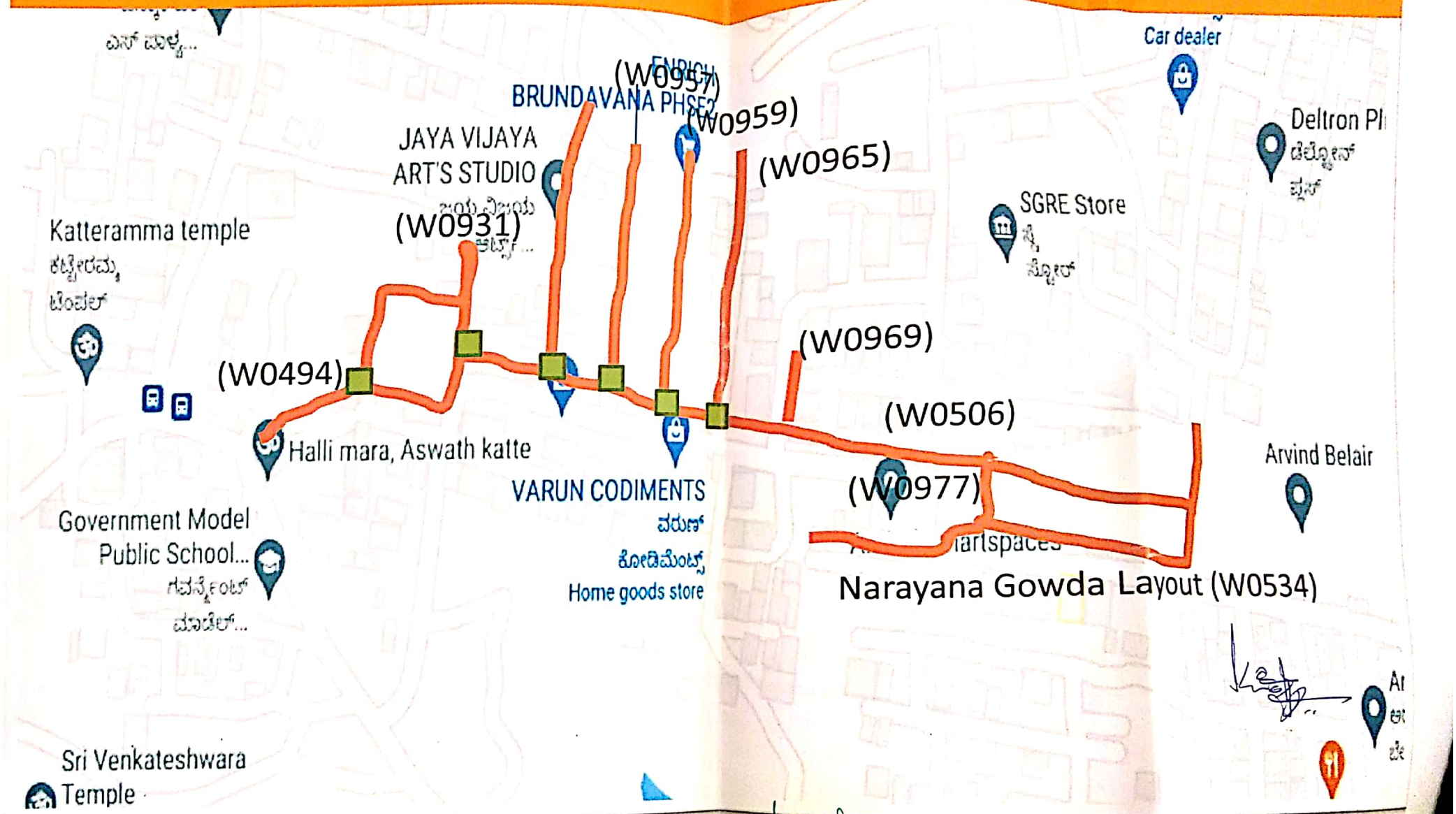
Restoration and Improvements of Chennamma and narayanappa layout and surrounding areas in ward no -03 of Yelahanaka Satellite town sub division



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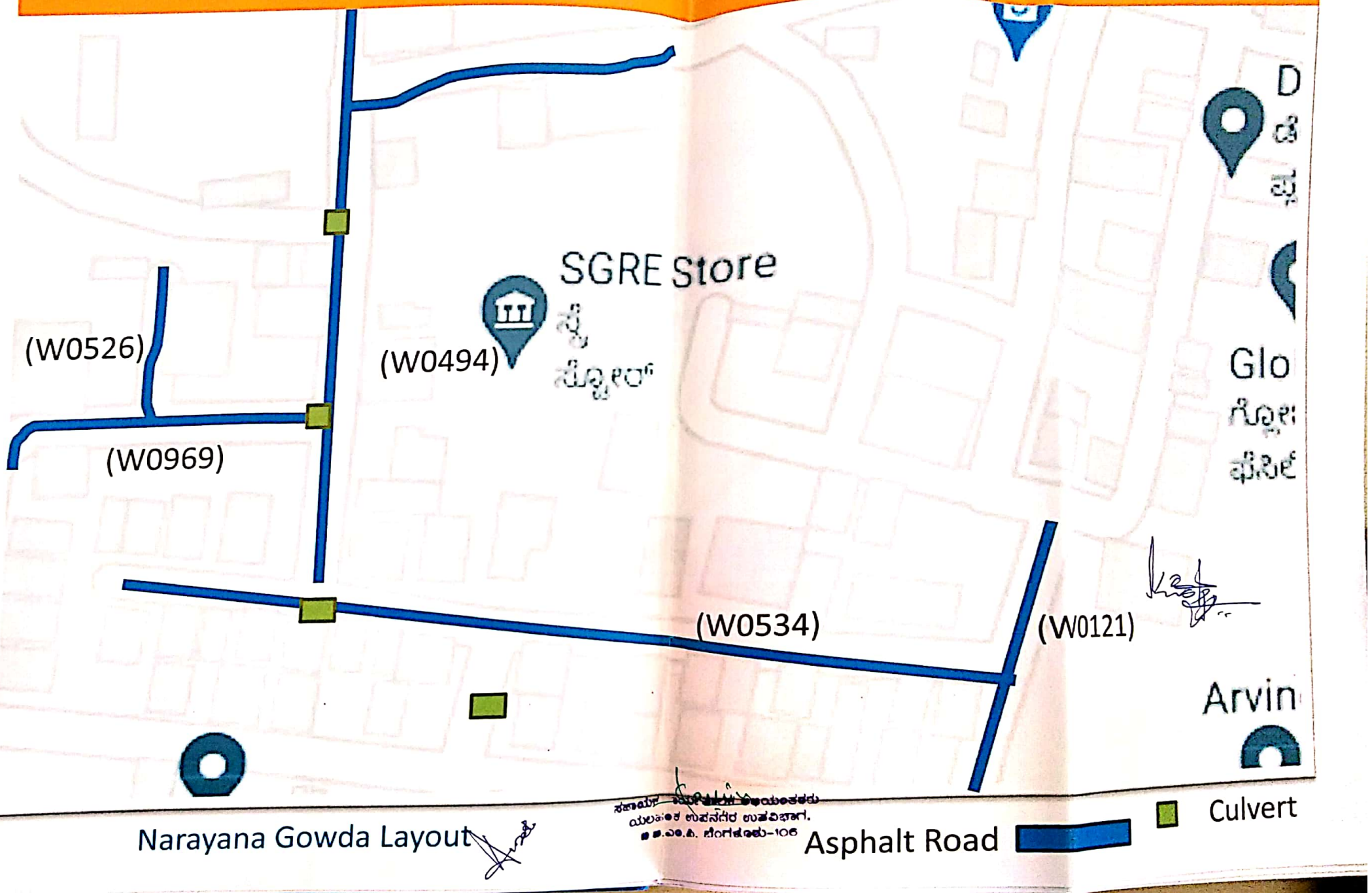
Restoration and Improvements of Narayana Gowda layout and surrounding areas in ward no - 03 of Yelahanaka Satellite town sub division



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Restoration and Improvements of Basavalingappa layout and surrounding areas in ward no -03 of Yelahanaka Satellite town sub division

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DRAWINGS

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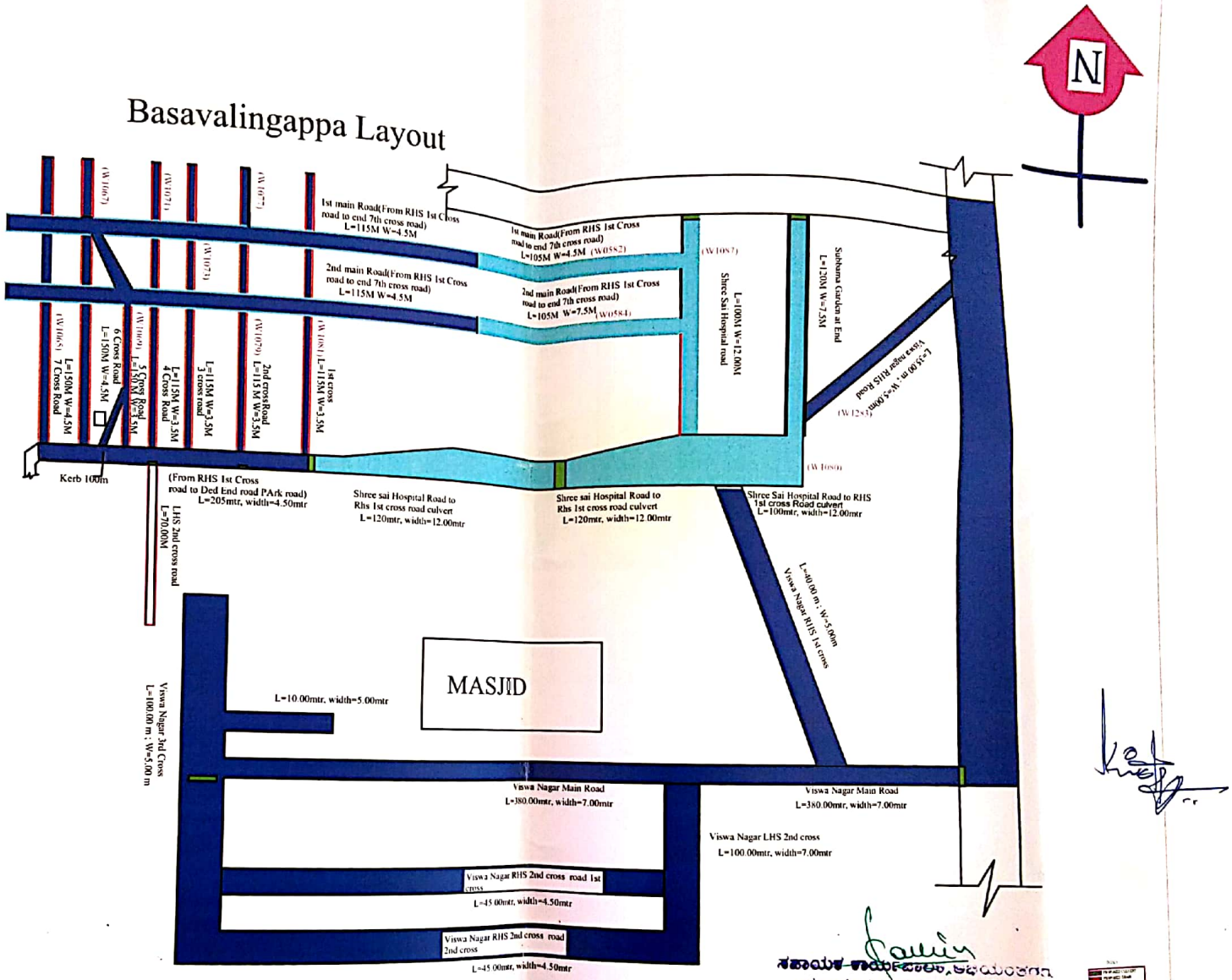
Basavalingappa Layout


N
1st main Road(From RHS 1st Cross road to end 7th cross road) L=115M W=4.5M
1st main Road(From RHS 1st Cross road to end 7th cross road) L=105M W=4.5M (W0582)
2nd main Road(From RHS 1st Cross road to end 7th cross road) L=115M W=4.5M
2nd main Road(From RHS 1st Cross road to end 7th cross road) L=105M W=7.5M (W0584)
(W1087)
Shree Sai Hospital road L=100M W=12.00M
Subhasra Garden at End L=120M W=7.5M
(W1088)
(W1086) 7 Cross Road L=150M W=4.5M
6 Cross Road L=150M W=4.5M
(W1069) 5 Cross Road L=150M W=4.5M
4 Cross Road L=115M W=3.5M
3 cross road L=115M W=3.5M
(W1070) 2nd crossRoad L=115 M W=3.5M
(W1071) 1st cross L=115M W=3.5M
Kerb 100m
(From RHS 1st Cross road to Ded End road PArk road) L=205mtr, width=4.50mtr
Shree sai Hospital Road to Rhs 1st cross road culvert L=120mtr, width=12.00mtr
Shree sai Hospital Road to Rhs 1st cross road culvert L=120mtr, width=12.00mtr
Shree Sai Hospital Road to RHS 1st cross Road culvert L=100mtr, width=12.00mtr
LHS 2nd cross road L=70.00M
L=10.00mtr, width=5.00mtr
MASJID
Viswa Nagar 3rd Cross L=100.00 m ; W=5.00 m
L=80.00 m ; W=5.00m Viswa Nagar RHS 1st cross
Viswa Nagar Main Road L=380.00mtr, width=7.00mtr
Viswa Nagar Main Road L=380.00mtr, width=7.00mtr
Viswa Nagar LHS 2nd cross L=100.00mtr, width=7.00mtr
Viswa Nagar RHS 2nd cross road 1st cross
L=45.00mtr, width=4.50mtr
Viswa Nagar RHS 2nd cross road 2nd cross
L=45.00mtr, width=4.50mtr

Aartn Associates

Assistant Engineer

Bangalore-64

CLIENT: BRUHAT BANGALORE MAHANAGARA PALIKE	CONSULTANT:- AARTN ASSOCIATES	PROJECT:- CONSULTANCY SERVICES FOR DPR/FIELD SURVEY/GENERAL REPORT/BASIC DRAWING/TECHNICAL DETAILED DRAWING/DETAILED COST ESTIMATE FOR RESTORATION AND IMPROVEMENTS OF DHANNAMA AND NARAYANAPPA LAYOUT, NARAYANAGOWDA LAYOUT, BASAVALINGAPPA LYOUT AND SURROUNDING AREAS IN WARD NO-03 YELAHANKA NEW TOWN SUB DIVISION/PACKAGE NO-19)	Prepared by / Designed by / Checked by / Reviewed by / Date TITLE Restoration and Improvements of Basavalingappa layout and surrounding areas in ward no-03 of yelehanka satellite town sub division GO Si No : SCALE : NTS Revisions: Rev. R0, Date, Description

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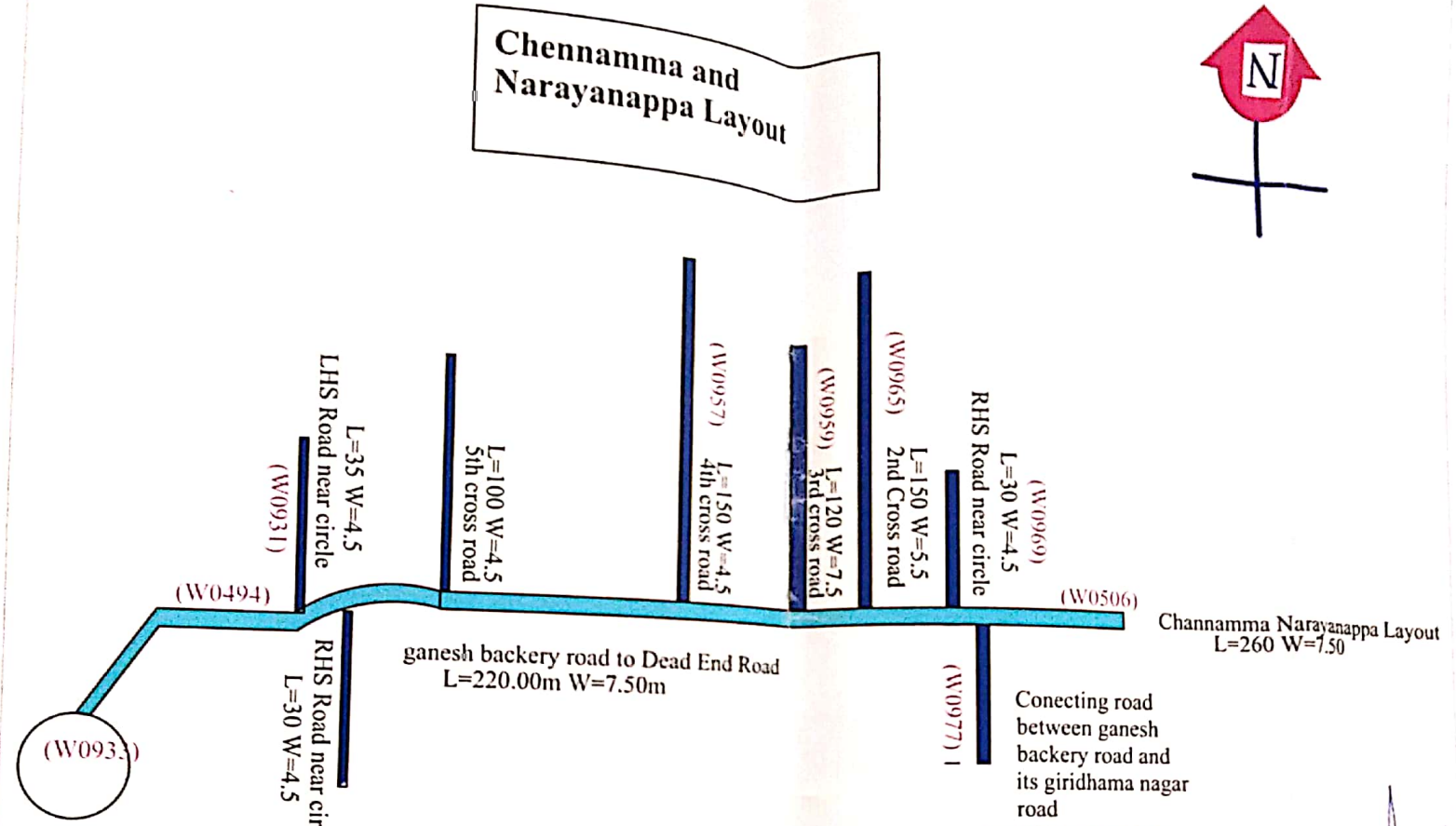
Chennamma and Narayanappa Layout



Aartn Associates

Assistant Engineer

Assistant Executive Engineer
Yelahanka Sub Division
Bangalore-64

CLIENT: BRUHAT BANGALORE MAHANAGARA PALIKE	CONSULTANT: AARTN ASSOCIATES	PROJECT:	Prepared by / Designed by / Checked by / Approved by / Date: SCALE: NTS

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Narayana Gowda Layout

Aarti Associates

Assistant Engineer

CLIENT:

BRUHAT BANGALORE MAHANAGARA PALIKE

CONSULTANT:

AARTI ASSOCIATES

PROJECT:

Revisions

SCALE: NTS

TITLE: Restoration and Improvements of Narayana Gowda Layout in ward no-63 of yelahanka satellite town sub division

GO SI No:

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